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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/728,862	12/04/2000	Sung Su Han	RD-28,168	3585

7590 08/19/2003

General Electric Company
CRD Patent Docket Rm 4A59
P.O. Box 8, Bldg, K-1 - Salamone
Schenectady, NY 12301

EXAMINER

VIJAYAKUMAR, KALLAMBELLA M

ART UNIT	PAPER NUMBER
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1751

DATE MAILED: 08/19/2003

4

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/728,862

Applicant(s)

HAN ET AL.

Examiner

Kallambella Vijayakumar

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Election dated 06/27/03.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) 23-26 and 28-34 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14, 19-22 is/are rejected.
- 7) ☒ Claim(s) 15-18, 27 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 December 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 1.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claims 1-34 are pending with the application. Priority date for the application is the filing date.

The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A (1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the examiner on form PTO-892 has cited the references and/or the applicant has provided IDS on PTO-1449, they have not been considered.

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-22 and 27 drawn to Method of making an electron emissive material, classified in class 252, subclass 500+.
- II. Claim 23, drawn to Fluorescent Lamp, classified in class 313, subclass 567+.
- III. Claims 24-26 and 28-30, drawn to method of determining work function, classified in class 324, subclass 72.
- IV. Claim 31-34, drawn to Kelvin Probe, classified in class 324, subclass 72.5.

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Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the instant process could be used to make a field emitting diode.

Inventions IV and III are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the work function could be determined by atomic force microscopy.

Inventions I-II and III-IV are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions Group-I/II relates to method of making an electron emissive material/ fluorescent lamp, while Groups-III/IV relate to an apparatus and its method of use that could be used to measure electronic properties of any material other than emissive materials.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, and the search required for Group I is not required for Groups II, III and IV, and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

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During a telephone conversation with Andrew J. Caruso on June 27, 2003 a provisional election was made without traverse to prosecute the invention of Group-I, claims 1-22 and 27. Affirmation of this election must be made by applicant in replying to this Office action. Claims 23, 24-26, 28-34 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention. Claims 1-34 are currently pending with the application.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Objections

Claims 15-18 and 27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: Prior art of record does not disclose or suggestive of a method of fabricating an array of pixels comprising the composition of the emission material per the limitations of the instant claims by the applicants, and the closest prior art by Srivatsava et al (US # 6,384,534) can not be used as it is assigned to same assignee.

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Claim Rejections - 35 USC § 102
Claim Rejections - 35 USC § 103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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Claims 1-3 are rejected under 35 U.S.C. 102(b) or in the alternative under 35 U.S.C. 103(a) as being unpatentable over Pietrzak (EP 578403).

Pietrzak (EP 578403) discloses a FED screen divided in to plurality of pixels, each pixel has a plurality of subpixels of different phosphor efficacies, wherein arrays of cathode comprise different densities of field emission tips (Abstract). All the limitations of the instant claims are met.

The reference is anticipatory.

In the alternative that the disclosure by Pietrzak et al be insufficient to arrive at the limitations of the instant claims by the applicants, it would have been obvious for a person of ordinary skill to make necessary modifications to the manufacturing steps, process and composition by the choice of design, optionally vary the work function of the emissive materials by doping, and optionally monitor the work function of the emissive material as a quality control check in the manufacture because of the importance of work function that is well known in the art as shown by Debe (US 5,726,524) in the analogous field of making of FED elements.

Claims 1-5 and 12-14 are rejected under 35 U.S.C. 102(e) or in the alternative under 35 U.S.C. 103(a) as being unpatentable over Warren et al (US 6,187,164).

Warren et al (US 6,187,164) discloses fabrication of individually addressable electrode arrays by delivering an array of diverse materials such as plating solutions to predefined locations of a substrate, wherein the compositions deposited may be obtained either by directly changing the solution composition and/or the concentration of each species or by using different electrochemical deposition parameters or both. Warren also discloses an electrochemical system

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for controlling the properties of the individual electrodes of the array (Abstract, Col-2, Lines: 54-67; Col-5, Line: 51 to Col-6, Line: 5). The varying of the emission properties of the materials by controlling the composition or by doping would be inherent by virtue of controlled and sequential injections of the reactants and varying of the spray compositions as desired in the process of making the arrays of emission materials, and the use of specific equipments/testing needed for the unit operation of the process. This meets the limitations of the instant claims of varying the properties of the individual pixels and measuring of a controlling property such as work function whose importance is well known in art as shown by Debe (US 5,726,524).

The reference is anticipatory.

In the alternative that the disclosure by Warren et al be insufficient to arrive at the limitations of the instant claims by the applicants, it would have been obvious for a person of ordinary skill to make necessary changes to the composition, to the steps of making the array and the selection of equipment and test methods by the choice of design, and optionally monitoring the work function of the emissive material as a quality control check in the manufacture, and with reasonable expectation of success in arriving at the limitations of the instant claims by the applicants.

Claims 6-11, 19-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Warren et al (US 6,187,164) in view of Watanabe et al (US 4,319,158) or Billings (US 6,051,165)

The disclosure by Warren et al on the fabrication of individually addressable electrode arrays is set forth as above.

Warren et al does not disclose the specific compositions of the oxide materials in the fabrication of the arrays containing emission centers.

Watanabe et al (US 4,319,158) teaches composition and making of electrode for discharge lamps comprising of Ba-Sr-Ca-W-oxide and oxides of La, Y and Be and further teaches the improvement in the emission from the fluorescent lamp as a function of molar ratios between La-oxide and Y-oxide that meets the ratio limitations of these components in the instant claims by the applicants (Col-5, Table-2).

Billings (US 6,051,165) discloses various electron emission materials for the electrodes comprising ternary and mixed oxides of Groups IV-B, III-B, II-A and rare-earth metals (Col-4, Lines: 20-41).

It would have been obvious for a person of ordinary skill to select the metal compositions of either Watanabe et al or Billings et al in the method of making arrays of electron emissive materials by Warren et al in order too benefit from such an incorporation of emissive oxide materials, because Watanabe and Billings teach such benefits in the analogous filed of the emissive materials and coatings for cathodes used in discharge lamps, and make necessary changes in the steps, equipment and testing methods for the manufacture of arrays by choice of design, with reasonable expectation of success in arriving at the instant claim limitations.

Conclusion

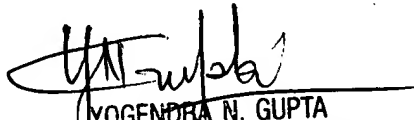
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kallambella Vijayakumar whose telephone number is 703-305-4931. The examiner can normally be reached on M-Th, 07:00 - 15.30 hrs, Fri: 05.30-14.00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Yogendra Gupta can be reached on 703-308-4708. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3599 for regular communications and 703-305-3599 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

kmv
August 11, 2003


YOGENDRA N. GUPTA
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